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Information technology — Automatic identification and data capture techniques — Bar code verifier conformance specifications —

Part 1: Linear symbols

Technologies de l'information — Techniques d'identification automatique et de saisie de données — Spécifications de conformité des instruments de vérification du code à barres —

Partie 1: Symboles linéaires

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Foreword

ISO (the International Organization for Standardization) and IEC (the International Electrotechnical Commission) form the specialized system for worldwide standardization. National bodies that are members of ISO or IEC participate in the development of International Standards through technical committees established by the respective organization to deal with particular fields of technical activity. ISO and IEC technical committees collaborate in fields of mutual interest. Other international organizations, governmental and non-governmental, in liaison with ISO and IEC, also take part in the work.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

In the field of information technology, ISO and IEC have established a joint technical committee, ISO/IEC JTC 1. Draft International Standards adopted by the joint technical committee are circulated to national bodies for voting. Publication as an International Standard requires approval by at least 75 % of the national bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this part of ISO/IEC 15426 may be the subject of patent rights. ISO and IEC shall not be held responsible for identifying any or all such patent rights.

International Standard ISO/IEC 15426-1 was prepared by Joint Technical Committee ISO/IEC JTC 1, *Information technology*, Subcommittee SC 31, *Automatic identification and data capture techniques.*

ISO/IEC 15426 consists of the following parts, under the general title *Information technology — Automatic identification and data capture techniques — Bar code verifier conformance specifications*:

— *Part 1: Linear symbols*

— *Part 2: Two-dimensional symbols*

Annexes A and B form a normative part of this part of ISO/IEC 15426.

Introduction

The technology of bar coding is based on the recognition of patterns encoded in dark and light elements of defined dimensions according to rules defining the translation of characters into such patterns, known as the symbology specification.

The bar code symbol, as a machine-readable data carrier, must be produced in such a way as to be reliably decoded at the point of use, if it is to fulfil its basic objective. Standard methodologies have been developed for measuring and assessing the quality of symbols for process control and quality assurance purposes during symbol production as well as afterwards.

Manufacturers of bar code equipment, the producers of bar code symbols and the users of bar code technology require publicly available standard conformance specifications for measuring equipment applying this methodology, to ensure the accuracy and consistency of performance of this equipment.

Information technology — Automatic identification and data capture techniques — Bar code verifier conformance specifications —

Part 1: Linear symbols

1 Scope

This part of ISO/IEC 15426 defines test methods and minimum accuracy criteria for verifiers using the methodology of ISO/IEC 15416 for linear bar code symbols, and specifies reference calibration standards against which these should be tested. This part of ISO/IEC 15426 provides for testing of representative samples of the equipment.

NOTE ISO/IEC 15426-2 applies to verifiers for two-dimensional bar code symbols.

2 Conformance

The instrument shall be considered to conform with this part of ISO/IEC 15426 if it performs the functions defined in 6.3 and if the results of measurements of primary reference test symbols carried out in accordance with clause 8 meet the following conditions:

a) the measured overall symbol grade, to one decimal place, is within ± 0,2 of the overall symbol grade declared by the supplier of the primary reference test symbol, and

b) the arithmetic means of the ten measurements of individual reported parameters are within the tolerances shown in Table 1 below, and

c) the ten measured grades for individual reported parameters, rounded to the nearest whole number, are the same as the grade declared by the supplier of the primary reference test symbol.

Table 1 — Tolerances for measured parameter values

Parameter	Tolerance
R_{max}	± 5 % reflectance
R_{min}	± 3 % reflectance
Decodability	± 0,08
Defects	± 0,08
NOTE The tolerances are additional to any tolerances stated by the supplier of the primary reference test symbols.	

3 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO/IEC 15426. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO/IEC 15426 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 2859-1:1999, *Sampling procedures for inspection by attributes — Part 1: Sampling schemes indexed by acceptance quality limit (AQL) for lot-by-lot inspection*.

ISO 3951:1989, *Sampling procedures and charts for inspection by variables for percent nonconforming*.

ISO 9000-1:1994, *Quality management and quality assurance standards — Part 1: Guidelines for selection and use.*

ISO 9001:1994, *Quality systems — Model for quality assurance in design, development, production, installation and servicing*.

ISO 9002:1994, *Quality systems — Model for quality assurance in production, installation and servicing*.

ISO/IEC 15416, *Information technology — Bar code print quality test specification — Linear symbols*.

EN 1556:1998, *Bar coding — Terminology*.

4 Terms and definitions

For the purposes of this part of ISO/IEC 15426, the terms and definitions given in EN 1556 and the following apply.

4.1
primary reference test symbol
bar code symbol intended for the testing of the accuracy of bar code verifiers and manufactured to close tolerances, of at least ten times the precision of the verifier to be tested, by methods traceable to national standards

5 Symbols and abbreviations

R_{max} maximum reflectance, as defined in ISO/IEC 15416

R_{min} minimum reflectance, as defined in ISO/IEC 15416

PCS Print Contrast Signal, as defined in EN 1556

6 Functional requirements

6.1 General requirements

The general requirement of a bar code verifier is that it shall provide assessments of the quality of a bar code symbol which are accurate and consistent, both in relation to measurements of a specific symbol made with the same instrument over a period of time and in relation to measurements of a specific symbol made by different instruments. Such consistency is essential to enable valid comparisons to be made of assessments of a symbol verified at two different times or on two different instruments.

6.2 Reflectance calibration

Verifiers shall have means of calibration and adjustment where necessary of reflectance values against reference reflectance calibration samples. ISO/IEC 15416 provides for the use of two calibration points, one as near the high reflectance end of the range and the other as near the low reflectance end of the range as possible.

6.3 Mandatory functions

A bar code verifier, in accordance with ISO/IEC 15416, shall be capable of:

— collecting reflectance measurements from points along one or more scan paths across a bar code symbol;

— establishing a scan reflectance profile from these measurements;

— analysing the scan reflectance profile;

— reporting individual scan reflectance profile parameter grades;

— determining and reporting an overall symbol grade (including aperture diameter and peak wavelength of light used);

— reporting the decoded data;

— reporting all encoded symbol characters.

The method of reporting is not specified but may be by means of, for example, a display screen in the instrument, a printed report, or electronic communication with another device such as a computer.

6.4 Optional functions

Users of verifiers have differing requirements for the amount of detail reported by the instrument, and a verifier may therefore perform additional functions, for example:

— reporting of number of scan reflectance profiles on which the overall symbol grade is based;

— reporting of average and maximum and minimum bar width deviations;

— reporting of symbology verified;

— print-out or display of all or, at the user's option, selected scan reflectance profiles;

— calculation and reporting of Print Contrast Signal (PCS) as $(R_{max} - R_{min}) / R_{max}$.

NOTE The calculation of Print Contrast Signal is included to assist users following application specifications which define contrast by that method. This parameter correlates less closely than does Symbol Contrast with scanning performance.

7 General constructional and operational requirements

7.1 Installation, operation and maintenance

The manufacturer shall specify in documentation provided for or available to the installer, user and maintainer of the equipment the conditions for installation, operation and maintenance of the equipment. These documents shall indicate the recommended extent and frequency of maintenance, if any. When equipment which is the subject of this part of ISO/IEC 15426 is installed, operated and maintained in accordance with the above conditions, it shall be capable of operating as specified.